Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/CA05/000535

International filing date: 08 April 2005 (08.04.2005)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 60/560,036
Filing date: 08 April 2004 (08.04.2004)

Date of receipt at the International Bureau: 26 May 2005 (26.05.2005)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)

PA 1311708

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

April 25, 2005

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: ***60/560,036***
FILING DATE: ***April 08, 2004***

CA/05/535

By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

TRUDIE WALLACE
Certifying Officer

PTO/SB/16 (08-03)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

INVENTOR(S)		
Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Daniel B.	McKeown	Fergus, Ontario, Canada

Additional inventors are being named on the _____ separately numbered sheets attached hereto

TITLE OF THE INVENTION (500 characters max)

METHOD AND SYSTEM FOR AUTOMATICALLY FEEDING ANIMALS

Direct all correspondence to: **CORRESPONDENCE ADDRESS**

☑ Customer Number: 24629

OR

☐ Firm or Individual Name					
Address					
Address					
City		State		Zip	
Country		Telephone		Fax	

ENCLOSED APPLICATION PARTS *(check all that apply)*

☑ Specification *Number of Pages* 12 ☐ CD(s), Number _____

☑ Drawing(s) *Number of Sheets* 4 ☐ Other (specify) _____

☐ Application Date Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

☑ Applicant claims small entity status. See 37 CFR 1.27.

☑ A check or money order is enclosed to cover the filing fees.

☐ The Director is herby authorized to charge filing fees or credit any overpayment to Deposit Account Number: _____

☐ Payment by credit card. Form PTO-2038 is attached.

FILING FEE Amount ($): 80.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☑ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are: _____

Respectfully submitted,

SIGNATURE _____

TYPED or PRINTED NAME Daryl W. Schnurr

TELEPHONE (519) 579-3661 ext 326

Date April 7, 2004

REGISTRATION NO. 28,569 *(if appropriate)*

Docket Number: 65143.0001

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

MILLER THOMSON LLP
Barristers & Solicitors, Patent & Trade-Mark Agents

700, 22 Frederick Street
P.O. Box 578
Kitchener, ON, Canada N2G 4A2
Tel: 519.579.3660
Fax: 519.743.2540
www.millerthomson.com

DIRECT TEL: 519.579.3661 EXT 326
DIRECT FAX: 519.576.2030
E-MAIL dschnurr@millerthomson.ca

April 7, 2004

File No. 65143.0001

MS Provisional Patent Application
Commissioner for Patents
Alexandria, VA 22313-1450

SENT BY COURIER

Dear Sirs:

RE: Provisional Patent Application by Daniel B. McKeown

We are enclosing herewith the following documentation for process:

1. Provisional Application for Patent Cover Sheet;
2. Specification for the above invention to be filed as a provisional application;
3. 4 sheets of drawings;
4. Photocopy of Power of Attorney duly executed by Daniel B. McKeown under date of March 31, 2004;
5. The inventor claims small entity status. A bank draft in the amount of U.S.$80.00 representing your filing fee herein as a small entity is enclosed.

The name and address of the inventor is R.R.#3, Fergus, Ontario, N1M 2W4, Canadian Citizen.

We look forward to receiving your official filing receipt for the above provisional application in due course.

Yours very truly,

MILLER THOMSON LLP

Per:
Daryl W. Schnurr

DWS/br
encl.

METHOD AND SYSTEM FOR AUTOMATICALLY FEEDING ANIMALS

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates to a method and system of automatically feeding animals whereby the amount, type of food and frequency of feeding is controlled and monitored for each animal.

DESCRIPTION OF THE PRIOR ART

Automatic feeding systems for animals are known. Some, previous systems can record the amount of food consumed by each animal but cannot control the amount of food consumed. One previous system is described in Lanfranchi U.S. Patent No. 5,669,328

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a system and method for automatically feeding animals where the amount of food consumed by each animal is monitored and controlled automatically by the system. Further, it is an object of the present invention to provide a method and system of automatically feeding animals where there is more than one source of food and the type of food is monitored and controlled for each animal. It is still a further object of the present invention to provide a method and system for automatically feeding animals where the frequency of feeding is monitored and controlled and the system is able to monitor which food source is first approached and which food source is first tasted by each animal.

A method of feeding animals using an electronic system having a feeding station with at least one food source, said station being controllable by a programmable processor, said method comprising locating an electronic locating device on each animal to enable each animal to be individually identified by said system, placing said at least one food source in a controlled access location, controlling access to said at least one food source by each animal separately, storing information from each feeding and using at least some of said stored information for a subsequent feeding.

An automatic feeding system for animals comprises a feeding station with at least one food source. The station is controlled by a programmable processor. The animals have individual identifiers mounted thereon. The food source is located in a controlled access area, the access being controlled by a barrier. There is one barrier for each food source, the processor controlling each barrier. The processor identifies each animal and opens and closes each barrier for each food source to allow access or prevent access to each food source for each animal, determines the type and amount of each food source consumed by each animal, and stores information from a feeding in a memory. The processor controls each barrier based on information for each animal.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a top view of a feeding system;

Figure 2 is a side view of a feeding system;

Figure 3 is a front view of the feeding system.

Figure 4 is a top view of a further embodiment of an automatic feeding system with an overhead door for an opening;

Figure 5 is a side view of the system of Figure 4;

Figure 6 is a front view of the system of Figure 4;

Figure 7 is a top view of a further embodiment of an automatic feeding system having covers that lifts vertically upwards;

Figure 8 is a side view of the system of Figure 7;

Figure 9 is a front view of the system of Figure 7;

Figure 10 is a top view of a further embodiment of an automatic feeding system where covers open and close at an angle;

Figure 11 is a side view of the systems shown in Figure 10; and

Figure 12 is a front view of the systems shown in Figure 10.

DESCRIPTION OF A PREFERRED EMBODIMENT

In Figures 1, 2 and 3, there is shown a top view of an automatic feeding system 2 having a first feed source 4 and a second feed source 6. Each feed source 4, 6 is contained in a container 8 having a cover 10 which partially covers the container 8. Each container 8 is rotatably mounted on a weighing

station 12, 14 the food sources 4, 6 are contained in a housing 16 having a front 18 with an access opening 20.

There are a plurality of animals (not shown) with each animal having an identification device mounted thereon (not shown). Preferably, the identification device is an electronic device that is embedded beneath the skin of the animal. A reader 22 is mounted near the opening 20 to identify each animal that approaches the opening. A weighing station 24 extends outward from the front 18 of the housing 16 beneath the opening 20. Each cover has a motor 26 mounted thereon to cause the cover 10 to rotate relative to the container 8. Each motor 26 is connected to a second reader 28 mounted on each cover 10. The container 8 or bowl containing each food source 4, 6 does not rotate in the embodiment shown in the drawings. It is the cover 10 of each container 8 that is designed to rotate.

The automatic feeding system 2 is controlled by a programmable processor 30. The programmable processor can be a processor in a computer with a memory and display monitor or other display. Other programmable processors can be used that are not computers. The programmable processor must have a memory and preferably a flash memory. Also, the programmable processor is preferably networkable and can have a display or printer or some other means for obtaining output from the processor. There can be multiple feed stations and the stations can be controlled by multiple personal computers that are networked to one another or each station can have a built in processor to eliminate the personal computers. Alternatively, the multiple feed stations can each be controlled by a computer or processor that is independent of the computer or processor for each of the other stations. Each station can be programmed to monitor and feed a portion of the animals in the group of animals being monitored and fed by the stations. For example, if twelve cats are being fed by three stations, each set up to feed four cats. The first four cats would only be able to eat at the first station, the second four cats would only be able to eat at the second station and the third four cats would only be able to eat at the third station. The programmable processors must be able to accept

multiple scanners, multiple DC voltage outputs with USB. RS232 or RS 485 ports. Feeding stations can be placed right on the floor, through a wall or on a raised surface. Preferably a feeding station will be capable of running independently and be capable of running as part of a networked controlled by a computer.

In the automatic feeding system 2 shown in Figures 1, 2 and 3 when an animal approaches the opening 20, the animal will stand on the weighing station 24. A scanner (not shown) on the weighing station 24 will identify the animal and store the weight of the animal in memory. In the position of the covers shown in Figures 1, 2, and 3, the covers of both food sources 4, 6 are in the closed position. The reader 22, which is preferably a proximity meter or photocell, will identify the animal and depending on the information pre-programmed into the processor will either remain in the closed position or will provide access to one of the two food sources 4, 6 by causing the cover on that food source to rotate about the circumference of the container 8 for the food source until the cover has rotated far enough to allow the animal access to that food source. Since the food source is constantly being weighed, the amount of food that is being consumed by the animal will be determined and the information will be stored. The animal is also weighed immediately before and after it eats and those weights are also recorded. As the animal approaches its limit for the amount of food to be consumed at that feeding, the cover 10 will be moved from the open position to the closed position. For some animals, access may be permitted to both the food sources in sequence or simultaneously. As each animal approaches the feeding station, the processor will determine whether or not that animal will be permitted to eat anything, the type of food (i.e. from food source 4 or food source 6 or both) that the animal will be able to consume. The system will also monitor the number and frequency of feedings within a given time period and will prevent further access to the food sources for those animals that have consumed their limit for that particular time period. The system can also control the time of day when

each animal will be allowed to eat. The number of feeding allowed for each animal in a particular time period can also be controlled.

In Figures 4, 5 and 6, there is shown an automatic feeding system 40 having an overhead door 48. The feeding system 40 is very similar to the feeding system 2 shown in Figures 1to 3 except for the manner in which access is permitted to the food sources and the same reference numerals are used in Figures 4 to 6 as those used in Figures 1 to 3 for those components for those components that are identical. It can be seen that the front 18 of the housing 16 has two openings 44, 46 therein. The opening 44 has an overhead door 48 and the opening 46 has an overhead door 50. The doors are controlled by actuators 52, which are in turn controlled by the reader 22. The reader is controlled by the processor (not shown in Figures 4 to 6). The overhead doors, which can also be referred to as gates open and close the openings for which they are located. The opening 44 provides access to one food source 4 and the opening 46 provides access to the other food source 6. No covers are required on the containers 8 as the access to the food sources is controlled by the control of the gates.

In Figures 7, 8 and 9, there is shown an automatic feeding system 54 where the food sources 4, 6 have covers 56 thereon. The covers 56 open by moving a vertically upward and vertically downward relative to the containers 8. The covers are controlled by an actuator 58 that is in turn controlled by the reader 22. When the cover is up, it is in an open position and the food source is accessible. When the cover is down in the position shown in Figures 7 to 9, the cover is in a closed position and the food source is not accessible. The reader 22 controls the opening and closing of the food sources in the same manner as that described with Figures 1 to 3. The components shown in Figures 1 to 9 that are identical to those components shown in Figures 1 to 3 are described using the same reference numerals.

In Figures 10, 11 and 12, there is shown an automatic feeding system 60 where each container 8 has a hinge 62 at a back thereof connecting the cover 56 to the container 8. An actuator 64 is located at an upper front of the

cover 56 and is mounted at an angle with respect to the cover as shown in Figure 11. A bracket 66 holds the cover in place. The actuator is controlled by the reader 22 to move between an open retracted position and a closed extended position. The position shown in Figure 11 is the closed position. The same reference numerals are used in Figures 10 to 12 as those used in Figures 1 to 3 for those components that are identical. The actuators 52, 64 are preferably lineal actuators.

In summary, the automatic feeding system of the present invention is able to control when each animal can eat, the feed times for each animal, the amount of feed that each animal is allowed to consume and has consumed, the food source or food sources that will be accessible to each animal (i.e. the type of food), the body weight of each animal as it eats. The processor can adjust the door speed, the amount of time that the door stays open and control the number of times that each animal is allowed to eat each day.

With proximity meters and photocells that are electronically connected into the system, the system of the present invention can also monitor which feed source each particular animal approaches first and which feed source each animal consumes first. By using photocells and proximity meters that are connected into the automatic feeding system, the system is able to monitor the location of other animals within the feeding area. The proximity meters and photocells comprise a monitor. Preferably, the cameras are infrared cameras so that night feeding behaviour can be recorded.

The number of animals that can be controlled by the system will vary with the capacity of the processor, the capacity of the containers used and the type of animal. For example, an automatic feeding system in accordance with the present invention might be used to control and monitor the feeding of twenty cats. Alternatively, cats and dogs can be controlled and monitored by the same system with the dog food being made available through one food source and the cat food being made available through another food source. If one animal is overweight, the system could be used to deny access to that

animal completely for a given period of time or to shorten the period of access that the animal will be allowed to feed.

Preferably, bar codes are used to monitor and identify the food sources. Bowls are filled and taken to feeding stations with a handheld wireless scanner, the station is scanned, the first bowl is scanned and a scale is scanned for verification of the diet placement. When the series of bar codes is matched with the components, the first bowl is placed on the scale. The same procedure is used for the second food source.

The automatic feeding stations can be set up to be controlled online as well. Wired scanners can be used or wireless hand scanners can be used to calibrate the scales, check door function, check proximity meter or photocell function, check the station mode, for example, normal, waiting or training. Different procedures will be used by the automatic feeding system in the waiting or training mode than in the normal mode. The size and configuration of the feeding station will vary with the number and type of animals that are using the system. For example, instead of controlling access to the food sources by causing the covers to rotate on the containers or bowls, access can be controlled by having an opening in the housing for each food source with a door or gate that is electronically controlled to open and close the opening. The design of the door or gate will likely be different for cats than it is for dogs or other animals. The doors or gates will preferably have safety controls so that the door or gate will temporarily release rather than injure an animal.

It may also be desirable in some applications to have an electronic gate to discourage an animal from accessing the food source at particular times. The door, gates or covers are barriers that restrict access to the food sources by the animals.

Preferably, the identification device is a microchip that is implanted in each animal. When dogs are using the system, the doors that control access to each food source will preferably be designed to move up and down. For cats, the doors are preferably hinged or rotatable covers are used. When both dogs and cats are fed through the same feeding station the dogs will not be able to

access the food that is intended for the cats and vice versa. While the system is shown with only two food sources, any reasonable number of food sources can be used. Two or more feeding stations can be connected together to provide one large station controlled by one processor or computer system.

The system of the present invention can be used to test the acceptance of newly created food mixtures or types of food by monitoring the reaction of the animals. In other words, the animals themselves can be monitored to determine the choice of food that the animals prefer. A modem or LAN can be used with the system to allow the system to be remotely configured and controlled.

I CLAIM:

1. A method of automatically feeding animals using an electronic feeding system having a feeding station with at least one controlled access food source, said station being controlled by a programmable processor, said method comprising locating an electronic identification device on each animal to enable each animal to be individually identified by said system, placing at least one feed source in a controlled access location, programming said processor to control the feeding of each animal, storing information from each feeding for each animal, using said stored information to control and monitor each feeding for each animal, controlling an amount of feed that can be consumed based on the identification of each animal.

2. A method of feeding animals using an electronic system having a feeding station with at least one food source, said station being controlled by a programmable processor, said method comprising locating an electronic locating device on each animal to enable each animal to be individually identified by said system, placing said at least one food source in a controlled access location, controlling access to said at least one food source by each animal separately, storing information from each feeding by each animal, and using stored information for a subsequent feeding.

3. A method of feeding animals using an electronic system having a feeding station with one or more controlled access feed sources, said station being controlled by a programmable processor, said method comprising locating electronic identification devices on each animal to enable each animal to be identified individually by said system, placing said one or more feed sources in a controlled access area of said system, locating an access barrier for each feed source, programming said processor to allow access to a particular food source or food sources by a particular animal or animals, controlling said access, controlling an amount of each food source consumed by each animal by

opening and closing said barrier or barriers, storing the information for each feeding for each animal, using said information to control future feeding.

4. A method as claimed in Claim 3 wherein there are at least two controlled access food sources and said method includes the steps of controlling a type of food consumed by each animal.

5. A method as claimed in Claim 1 wherein there are two or more food sources, said method including the steps of controlling a number of food sources that a particular animal has access to.

6. A method as claimed in Claim 1 including the step of programming said processor to cut off access for a particular animal when that animal has reached a pre-determined amount of food for that feeding.

7. A method as claimed in any one of Claims 1, 2, or 3 wherein there is a memory for said processor, said method including the steps of storing information for each animal in said memory.

8. A method as claimed in any one of Claims 1 or 2 wherein said system has electronic gates thereon for each food source, said method including the steps of controlling an opening and closing of said gates for each animal and for each food source.

9. A method as claimed in Claim 1 wherein said system has an output and said method includes the step of outputting information stored within said system to an output.

10. A method as claimed in Claim 3 wherein said barriers are gates and said method including the steps of opening and closing each gate.

11. A method as claimed in any one of Claims 1,2 or 3 wherein there is a monitor on said system, said method including the steps of operating said monitor to record first approaches to each food source.

12. A method as claimed in any one of Claims 1, 2 or 3 wherein there is a monitor on said system, said method including the steps of operating said monitor to record first tastes of each food source.

13. An automatic feeding system for animals comprising a feeding station with at least one food source, said station being controlled by a programmable processor, said animals having individual identifiers mounted thereon, said food source being located in a controlled access area, said access being controlled by a gate, there being one gate for each food source, said processor controlling each gate, said processor identifying each animal and opening and closing each gate for each food source to allow access or prevent access to each food source for each animal, determining a type and amount of each food source consumed by each animal, storing information from said determination in a memory, said processor controlling each gate based on said information for each animal.

14. A system as claimed in Claim 13 wherein said identifiers are embedded beneath the skin of each animal.

15. A system as claimed in Claim 13 wherein said processor has an output electronically connected thereto.

16. A system as claimed in Claim 15 wherein said processor is a computer.

17. A system as claimed in Claim 13e wherein there is a monitor connected monitor at least one of first approaches and first tastes of each food source.

ABSTRACT OF THE DISCLOSURE

A method and system for automatically feeding animals uses identifiers on the animals and controls access to one or more food sources to control the amount consumed by each animal. The system is controlled by a programmable processor and can provide or prevent access and cut off access once provided based on the particular animal seeking food.

PTO/SB/81 (09-03)
Approved for use through 11/30/2005 OMB 0651-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number

POWER OF ATTORNEY and CORRESPONDENCE ADDRESS INDICATION FORM

Application Number	
Filing Date	
First Named Inventor	McKeown, Daniel B
Title	Method and System for Automatically Feeding Animals
Art Unit	
Examiner Name	
Attorney Docket Number	65143.0001

I hereby appoint:

☑ Practitioners associated with the Customer Number: 24629

OR

☐ Practitioner(s) named below:

Name	Registration Number

as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

Please recognize or change the correspondence address for the above-identified application to:

☑ The address associated with the above-mentioned Customer Number:

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name					
Address					
Address					
City		State		Zip	
Country					
Telephone		Fax			

I am the:

☑ Applicant/Inventor.

☐ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

SIGNATURE of Applicant or Assignee of Record

Name	Daniel B. McKeown		
Signature			
Date	Mar. 31/04	Telephone	519-843-5660

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☑ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

BEST AVAILABLE IMAGES

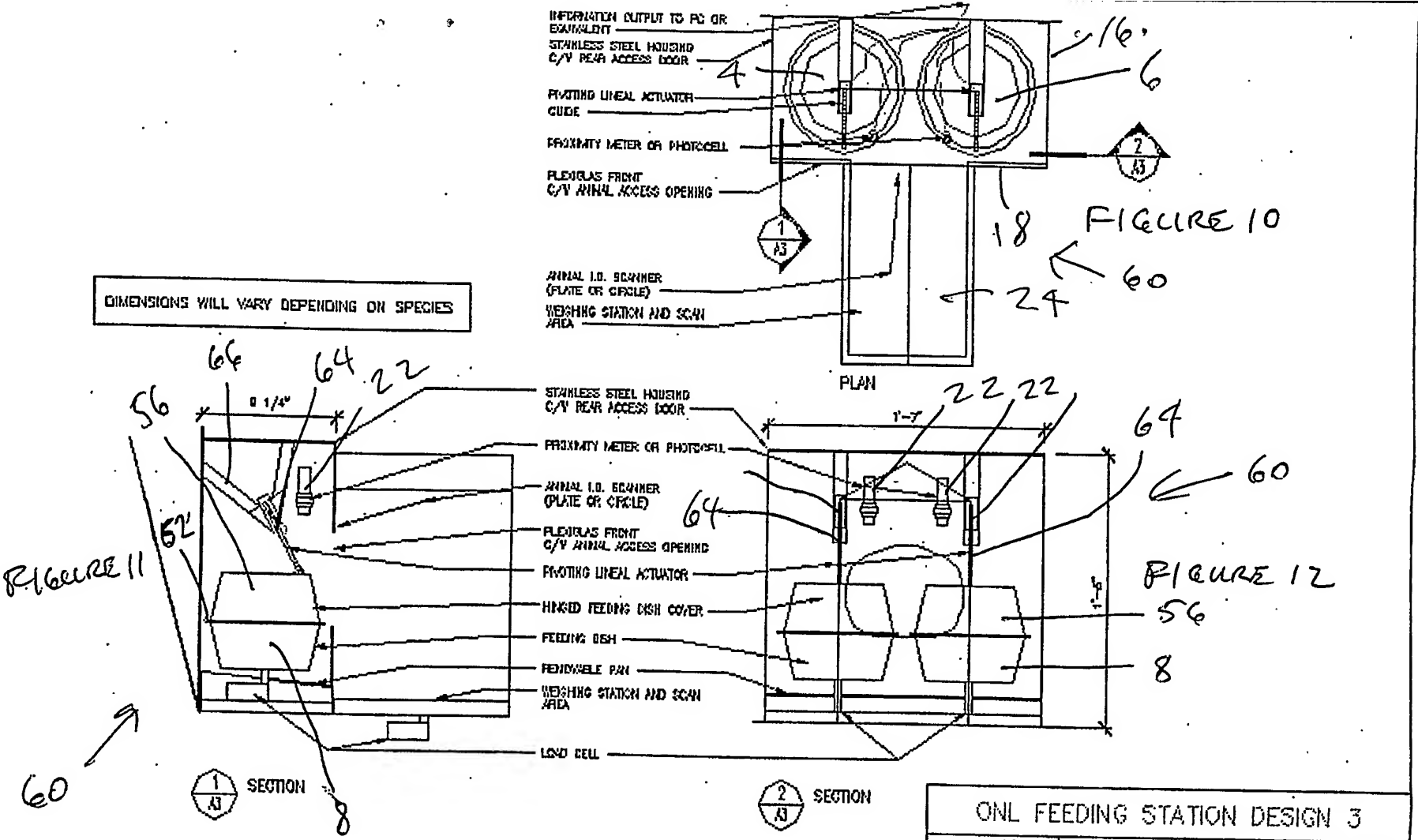
Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

As rescanning documents *will not* correct images, please do not report the images to the Image Problem Mailbox.



ONL FEEDING STATION DESIGN 3		
SCALE: 1 1/2"=1'-0"	PROJECT NO: 04001	DRAWN BY: S.H.H.
DATE:		
DRAWING: PLAN AND SECTIONS		
FINALDRAFT DESIGN		DRAWING NO: A3

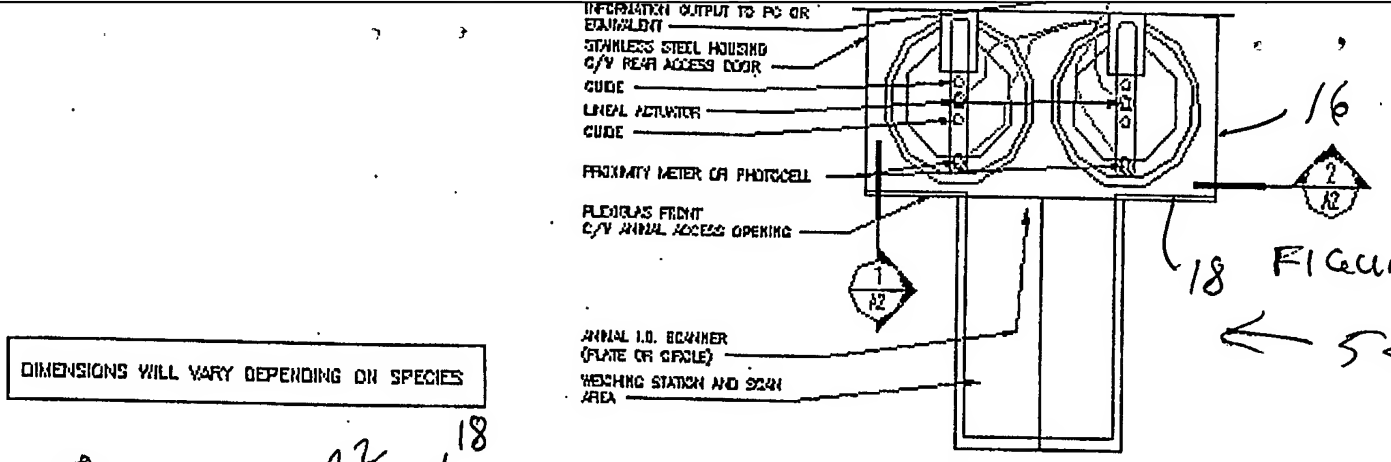


FIGURE 7

54

DIMENSIONS WILL VARY DEPENDING ON SPECIES

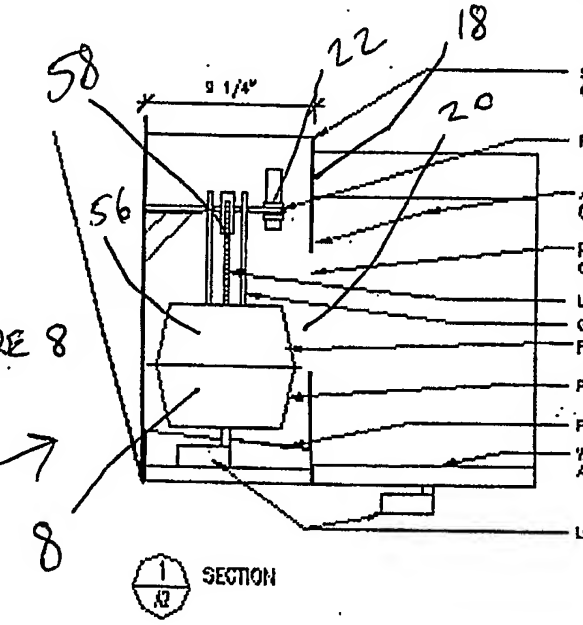


FIGURE 8

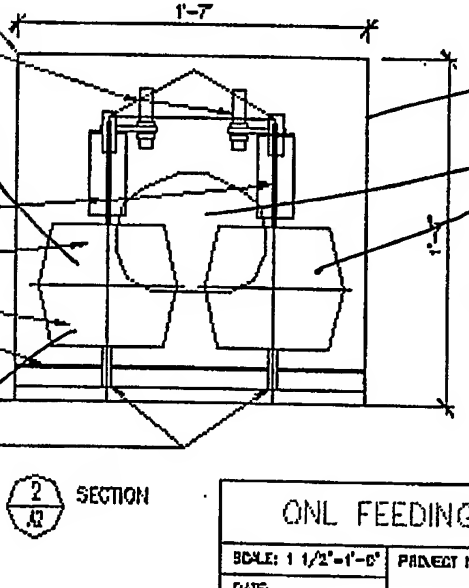


FIGURE 9

ONL FEEDING STATION DESIGN 2		
SCALE: 1 1/2"=1'-0"	PROJECT NO: 04001	DRAWN BY: S.M.H.
DATE:		
DRAWING: PLAN AND SECTIONS		
FINALDRAFT DESIGN		DRAWING NO: A2

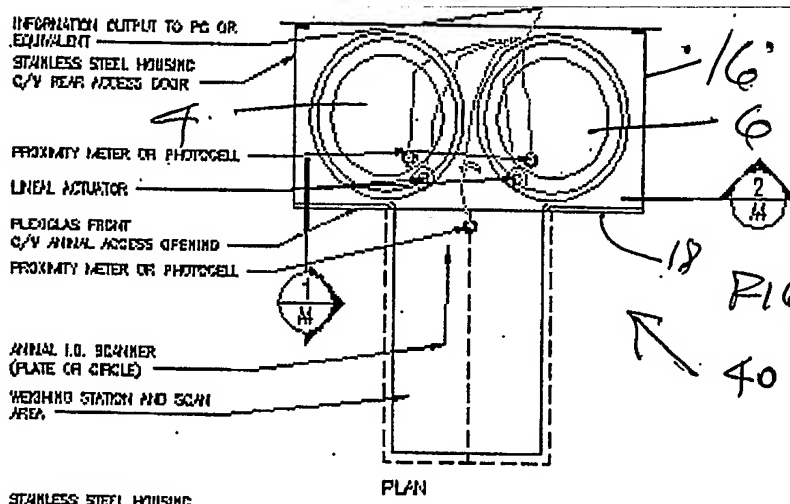


FIGURE 4

40

DIMENSIONS WILL VARY DEPENDING ON SPECIES

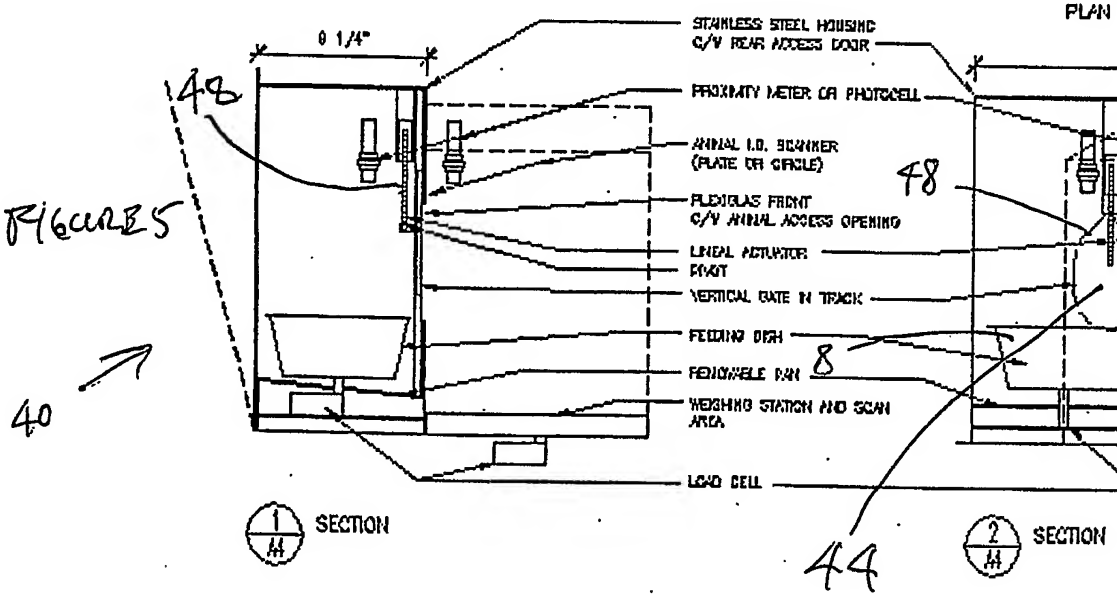


FIGURE 5

40

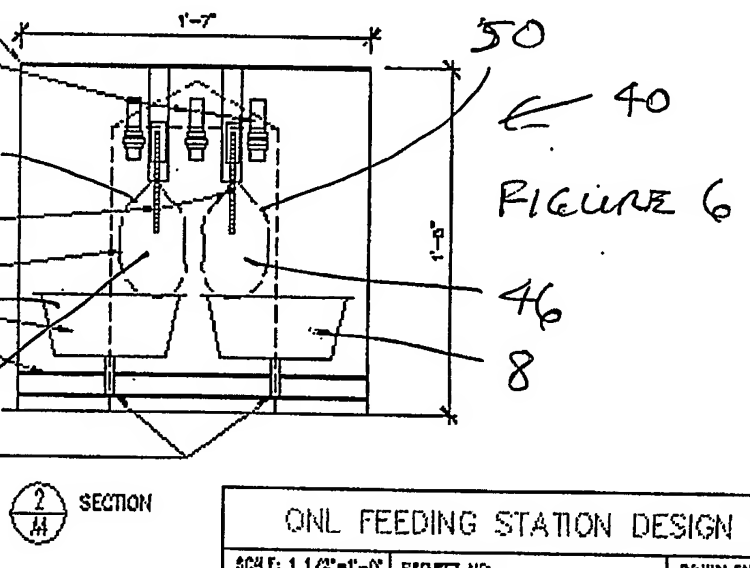
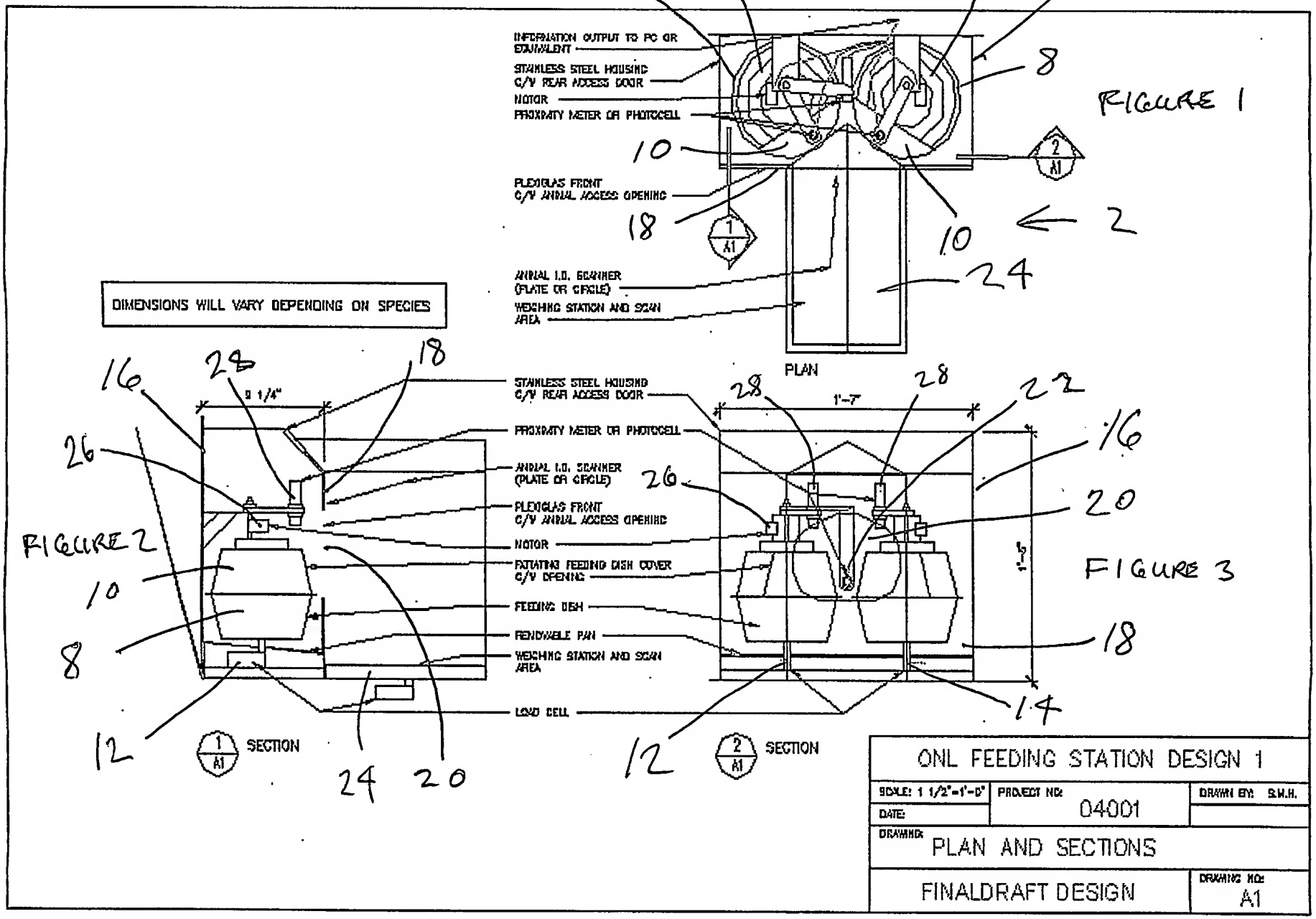


FIGURE 6

ONL FEEDING STATION DESIGN 4		
SCALE: 1 1/2"=1'-0"	PROJECT NO: 04001	DRAWN BY: S.M.H.
DATE:		
DRAWING: PLAN AND SECTIONS		
FINALDRAFT DESIGN		DRAWING NO: A4



ONL FEEDING STATION DESIGN 1		
SCALE: 1 1/2"=1'-0"	PROJECT NO: 04001	DRAWN BY: S.W.H.
DATE:		
DRAWING: PLAN AND SECTIONS		
FINALDRAFT DESIGN		DRAWING NO: A1